
FACTORS AFFECTING E-GOVERNMENT IMPLEMENTATION- DEVELOPING COUNTRIES E- OPPORTUNITIES

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Abstract

The developments in ICTs drive to initiate e- governments to comply with the citizens' new needs. This paper aims to present the factors affecting e-government implementation, by reviewing a wide range of literature from various countries which has differences in terms of development, income and culture. The study has developed Five Categories Classification Model (FCC) which outfits the interested in e-government topic with a ready comprehensive tool of factors affecting e-government implementation classified in five scientific disciplines of research. Also, this paper aims to assess the opportunities for developing countries to implement e-government depending on comparing E-Government Development Index (EDGI) and (GNI) among selected countries, in this regards, the study finds that it is not necessary to be a developed country to be in the "high" EDGI level group.

Key words: E-Government, E-transformation, Five Categories Classification Model (FCC)

JEL Classification: O30, O39, H19

Introduction

The world is at the threshold of the fourth industrial revolution (Shpak et al. 2019). Member States, through the UN General Assembly Resolution (66/288) have confessed that ICT (Information and Communications Technology) makes it easier for information to flow between governments and citizens in both directions, and have

stressed the role of ICTs in promoting the exchange of knowledge and technological collaboration (UN, 2012a).

Recently, many governments have started to use technology as an instrument to change relationships with their people (UNDESA, 2014). When governments began to use these technologies to transform some of their services into digital forms a range of terms were introduced, such as 'digital', 'e-' government, 'virtual', 'cyber' and the like, and have become epithets applied to various existing activities and social institutions, Woolgar (2002), so, the global information society, coupled with modern innovative capabilities, contributes to the digital transformation of countries, industries, and individual companies, Shpak et al., (2020); Klietkova & Janoskova (2017), and now transformation toward e-government is a global movement would not leave any one behind (Hussain et al., 2020; Todorovic et al., 2019).

The problem of transformation toward e-governments is the huge diversity of factors affecting e-government implementation which belongs to cross disciplines of science, making it more difficult to apply specialized-discipline researches in e-government context.

In this regard, UN has developed an index to measure national e-government capacities called EGDI; E-Government Development Index (UN, 2012b), this index is a tool for observing the process of e-government implementation around the world.

Literature review

This literature review is browsing factors affecting e-government implementation discussed into five approaches, covering a diversity of countries at different economic levels and with different cultures.

Political factors

Parent et al. (2005) discussed that e-government cannot increase trust in utilizing its services unless politicians make efforts to raise trust in government among citizens, irrespective of e-services. Considering this issue in e-government context, politicians are responsible for building perceived trust in citizens' minds to convince them using e-government applications, services and transactions. But before this, politicians themselves have to be already convinced of e-government importance in order to give proper supports to its projects, also it has been found that the existence of a belief among leaders is a main influencing factor for completing such projects successfully, especially among top leadership and the probabilities of success increase when leadership is strong, Kim et al., (2009); Bakacsi (2010), in the same tone, many studies as Heeks (2003) and Toots (2019) consider political and top management support to be vital in executing e-government, especially in e-democracy and e-participation (Council of Europe, 2009).

Here, Sang et al. (2009) discussed the leadership support factor from another perspective, finding that variations in support among leaders is an important factor affecting the balanced implementation of e-government among different agencies.

This mentioned variation in support threatens successful process of e-projects to achieve their goals within targeted time, especially when leaders are replaced by less interested ones who do not see e-government as a high priority in poor countries, this low prioritization level of e-government leads to consider another important factor that enables e-government as a high priority, which is clear strategy toward realizing e-government (Al-Shboul et al., 2014).

In a political environment, resistance to change is a key obstacle facing transformation to e-government since it is a common behavior among low and medium level politicians, Al-Shboul et al. (2014), particularly in the domain of e-democracy.

In the context of e-democracy Mahrer and Krimmer (2005) find that the majority of Austria's politicians are strongly opposed to e-democracy, which is probably caused by a fear of reallocating power and/or losing control and status (Toots 2019).

Finally, the changing environment that will be created by transformation to e-government calls for comprehensive policies, legal and regulatory framework (Toots 2019; Homburg, 2008). This means new applications will be needed for e-transactions such as e-signatures, protecting data from hackers and e-crime definitions, this will cause structural and legal complexity in this new domain (Osborne and Brown, 2011).

Social factors

Beginning from perceived awareness of e-government concept, Sang et al. (2009) confirmed that this awareness is positively related to e-government adoption; in this context some researchers focused on citizens' awareness of e-government services and their value, as it will create a stimulus to use services of e-government, Torkzadeh and Dhillon (2002), whereas Parent et al. (2005) expressed that the lack of knowledge or awareness of e-government services can be considered a significant obstacle to the adoption of e-government, this obstacle is not only limited to awareness of services, but extends to the awareness of the ease of e-participation, Voorberg et al. (2015); Roblek et al. (2020) and to the relative advantage for the user (Rokhman, 2011). Staying within the same context, several e-learning studies, such as Salloum et al. (2018) and Dabija et al., (2014) deal with acceptance of e-learning as an affecting factor; as e-learning is a specific example of e-services. In general, most of researches which discussed social factors affecting implementation and adoption of e-government have embedded the ten dimensions of "Service Quality" scale, (Parasuraman et al.,1988). Consequently, perceived quality of service is crucial in shaping customers intentions towards using services, Shi et al. (2018); Meyer et al. (2016), the same is true for e-government services, where information quality and its determinants- good organization, completeness, accuracy, relevant content (or linkage), fulfillment, up-to-date information, timeliness, perceived service response and integrated information- create a perceived reliability which is one of the service quality dimensions that, in turn, influences citizens' decisions to use e-government services (Tóth et al, 2018; Parasuraman et al., 2005).

This perceived service quality may develop an e-government attitude among citizens to adopt and use these services, since attitude is considered by many researches as an affecting factor in the adoption of e-government such as Eggers (2004) found that attitudes towards e-government system usage can be enhanced by giving sufficient incentives to move to digital-channel government, these incentives can include offering a discount for completing transactions online or raising cost of using other channels.

From another approach, trust is considered an important factor in forming citizens' willingness to adopt e-services, Bernhard (2014), as trust here operates in a virtual environment where citizens have very few tangibles to ensure performance and credibility of the service provider (Urban et al., 2000). This perceived trust is built on uncertainty, security, privacy, and risk, Oláh et al. (2019), as the results of many studies concerning e-government and e-commerce have shown (Parent et al., 2005). Depending on the researches of Bélanger and Carter (2008) it could be concluded that the perceived security can give the users of web services a kind of risk avoidance

feeling, allowing them to continue using virtual transactions, this perceived risk differs from user to user, depending on his characteristics and ranges from performance and financial transaction security risks, to convenience, psychological, social, and aggregate risks (Kumar et al., 2007). Moving on to the privacy context, when carrying out their transactions online, customers may doubt that their secret data and personal information may be disclosed, or misused (Brown and Muchira, 2004). This leads to what Parasuraman et al. (2005) concluded in their research of online e-services, that privacy is a key determinant in whether customers use the Internet to perform interactions online, since there are feelings that their privacy might be at risk.

Weerakkody et al. (2014), after a deep study of the literature found that the perceived ease of using e-services, perceived risks, perceived benefits, quality of services and systems, quality of information, trust, attitudes and overall satisfaction were the most frequently occurring indicators of e-government satisfaction and adoption, whereas Rokhman (2011) finds that the compatibility of e-government systems with attitudes of citizens and their values and beliefs is a significant predictor of citizens' intention to use state e-government services, and will eventually lead to the successful implementation of such a system.

Technological factors

When e-government will be implemented it is expected that all beneficiaries can access it from one integrated gateway, Layne and Lee (2001), which means different organizations have to provide their services through that gateway. This requires system integration that provides fewer online functionalities, Al-Khouri and Bal (2007), and compatible-standardized (IT) systems for working seamlessly, keeping in mind that incompatible hardware/ software among different institutions may cause malfunctions in working (Al-Shafi, 2009). Standards help designers of system software/ hardware to develop services in different ways, and at the same time they enable these services to be well-suited and compatible with each other when necessary (Gál et al., 2013).

Much research has shown that a lack of adequate IT/ICT infrastructure is a major factor in preventing successful e-government implementation (Sang et al., 2009). Rokhman (2011) insists that infrastructure availability is a precondition for implementing e-government. Basamh et al. (2014) claim that even though the availability of technological infrastructure is a vital condition for governments to attain e-transformation, it is not sufficient unless these e-services are made easy to use and accessible to the beneficiaries from a technological perspective, which means accessibility is a key factor that should be considered when designing websites (Alomari et al., 2009). These websites should be easy to learn, give easy access to information, OECD (2003), increase productivity and effectiveness, and make work better and easier (Davis, 1989). Toots (2019) did not only pay attention to website design, but also highlighted the design of the whole e-government system as one of the key success factors in its implementation. A good design will make the system useable, interactive, and adaptable to technological developments, considering the special needs and circumstances of different target groups (Panopoulou et al., 2014). In addition to being controllable, understandable, flexible and allowing users to become skillful (Kumar et al., 2007).

Referring to the section on social factors, among most studies the security and privacy of e-services for users were central factors, especially as regards the threats from hackers and the dangers arising from using data analytics which brings risks of privacy violation and unprotected data (Waidner and Kasper, 2016). This puts pressure

on designers to solve this issue technically and provide a trusted and secure medium, otherwise it would be a great barrier to implementing e-government (Al-Khouri and Bal, 2007). Also, related to social factors, where perceived service quality occupies a vital role in e-government adoption, from a technological perspective Dabholkar (1996) has estimated the quality of technology by measuring the following indicators: delivery speed, ease of using technology applications, reliability, enjoyment of users, control, previous experience, necessity for dealing with service employees, and quality of services.

Organizational factors

Institutional theory expresses the idea that organizational change will receive consent from the different players so long as they feel its perceived usefulness to them Lawrence and Suddaby (2006) so the perceived benefits of e-government to employees in public institutions and agencies would decrease the resistance to change, so, some employees may also exhibit a self-protecting attitude or action when they sense that forthcoming technologies represent a threat to them Bernhard (2014), for example, when they become suspicious about being laid off, feel that their influence and control over traditional operations is weakening, Al-Shafi (2009), or perceive that there is a declining number of middle managers and a reduced role for them (Burn and Robins, 2003). All of these feelings can lead to negative attitudes in this regard (Weerakkody and Currie, 2003). This resistance to change also derives from the existence of a risk-avoidance culture in public institutions and agencies, the influence of state and governance traditions, organizational settings and internal anchoring, Voorberg et al. (2015); Bernhard (2014), which Toots (2019) has called 'institutional resistance'. So, what is important in a successful adoption of e-government is to spread awareness of the relevancy and usefulness of e-government Sang et al. (2009), which draws on political, social and organizational aspects.

Returning to the debate on social factors related to the importance of citizens' awareness of e-government as a successful key factor for its adoption, it is important to emphasize the need to raise awareness among citizens by organizing campaigns targeted to deploy e-government services which encourage citizens towards more participation and ultimately the successful implementation of these services. These campaigns are part of the organizational planning, goals and strategy which are considered important organizational factors in the e-government implementation process (Bernhard, 2014).

Widening the discussion about training within organizations, Heeks (2006) stated that *"In a centralized approach, training is planned and prioritized organization-wide to fit in with e-government plans"*, this is necessary to improve human resources qualifications to fit the new system because the lack of IT literacy and skills, Meyer and Hamilton (2019); Basamh et al. (2014); Sang et al. (2009), insufficiently skilled human resources, deficiencies in the market for well-trained IT employees, scarcity in technical and relevant IT skilled staff, a lack of program knowledge (Ashaye, 2014), low managerial and technical backgrounds, Paroski et al. (2013), and a high turnover rate among information technology employees working for governments, Sang et al. (2009), are all considered significant factors influencing e-government implementation. Behind organizations' strategies there are organizational cultures which encourage or impede the e-government implementation process (Kim et al., 2007).

Financial factors

Many researchers have mentioned financial resources and financial constraints as important affecting factors in e-government implementation processes, Klietk et al. (2018); Paroski et al. (2013), and most of studies in this context have focused on the availability and accessibility of an adequate infrastructure as one of major determinants of successful e-government, whether it be technological, organizational, or human infrastructure (Rokhman, 2011; Sang et al., 2009; Layne and Lee, 2001; Lentner et al. 2019).

Very few studies, however, have dealt with the high cost of this infrastructure and its supplying resources; as Basamh et al. (2014) stated, a high infrastructure cost is a key barrier that prevents the initiation of e-government.

Since e-government investments are a longer term strategic activity, these investments need long-run governmental finance and also need to develop indigenous funding sources, Madon et al. (2007); this creates a barrier to implementing these e-government projects given the difficulties of providing secured and continuous funding for these projects along their long-term timelines in an environment of high pressure on the public sector to constrain its expenditure and resources (Kovacova et al., 2019; Ojha and Pandey, 2017). This means there will be a long- term investment without direct revenues or profits with a high risk of setbacks to e-government projects, which, according to Heeks (2001), means that 20-25% of these projects end in total failure and 33-60% in partial failure.

In the same context the Standish Group Report (2009) finds that only 32% of e-government projects succeed in accomplishing their goals on time and within budget. In other words, there is a high risk of a significant loss of major e-government investments. So, the OECD (2001) recommended avoiding large IT projects in the context of e-government implementation since they have a great risk of failure, and replacing them by small high visible projects, considering that large projects maybe a barrier facing e-government implementation due to the high financial risk of failure.

The problem of financing large projects such as e-government implementation programs is also affected by private sector collaboration with the public sector in financing projects, which differs due to the varying development levels of different countries.

On the one hand, developed countries have a private sector which actively collaborates in financing these kinds of projects, while on other hand, in developing countries the public sector provides financial resources for the vast majority of large projects, Benoit (1996) taking in regards that in e-administration processes banks plays a pioneer role, Dunay et al. (2011); Wyslocka et al. (2017), but the degree of private sector funding poses other problems for governments: deciding the degree of the private partner's control over providing the services, the value of service tariffs, and the management and the ownership of assets, which the public may oppose; this may involve complex transactions, and arrangements between private and public sectors (Ojha and Pandey, 2017, Sitenko and Vasa, 2018).

From another perspective, finance from the private sector has many benefits which Ojha and Pandey (2017) defined as optimized decision making in investments, risk reduction, optimal structure of resource provision and resolving the e-governance project funding question.

Finally, if the e-project fails at any point and if e-government implementation fails, there will be costs in operating an IT infrastructure which has an un-integrated composition, in addition to inconsistent repetitive abundant data and systems (Al-

Shafi, 2009), also, it can be understood from Ashaye (2014) that thinking about financial constraints and funding for implementing e-government projects should not stop at the cost of installation, but also include the cost of operating, maintaining and upgrading ICT systems, the employment of IT professionals, training, system development and consultancies.

All above mentioned factors should be taken into consideration or the projects will be vulnerable to failure after a successful installation. These were the considerations which Joshi and Islam (2018) discussed as affecting factors on sustainable e-government in their discussion about the maturity model of e-government in the context of sustainable e-services, while Al-Shboul et al. (2014) only stressed budgets and operating costs.

Results and debate

Based on the approach discussed in literature review this study provides comprehensive factors that affect e-government implementation process, refined in five categories; Political, Social, Technical, Organizational and financial, which is presented as Five Classification Categories Model (FCC) ready tool- illustrated in Figure (1).

This new tool (FCC) should be correlated with five tables follows FCC categories, each table contains a group of affecting factors concern in one category of (FCC) Model, collected from reviewed literature, and each table serves as a stand-alone tool for easy use by specialized researches.

Five categories classification (FCC) Model of factors affecting e-government implementation

Weerakkody et al. (2011), Bonham et al. (2001) and Al-Shafi, (2009) have summarized a diversity of factors affecting e-government implementation, classified in four areas: political, social, technological, and organizational factors; these areas cluster almost all the factors in the literature those studies have browsed. Other researchers have used different classifications, such as Ashaye (2014) who proposed the following classifications: technological and IT infrastructure, economical and financial, trust and security, human skills and IT literacy, operational and organizational factors.

However, we can notice in this classification that some factors belong to more than one category, for example security, which can be included under technological infrastructure as a technical IT task as much as it can be considered a social factor from another point of view.

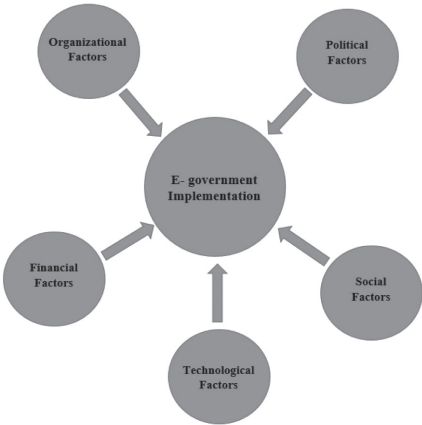
Also trust could also be divided into citizens' trust in system and citizens' self-trust or confidence, which belongs to the social factors category, which have not been covered by this classification, even Oláh et al. (2017) and Pakurár et al. (2019) have discussed trust in an organizational context.

This research follows the first classification, but also adds another category- financial factors- as an independent category due the importance of funding and budgeting to attain successful and sustainable e-government (Al-Shafi, 2009), given that the cost itself could be a significant obstacle (Heeks, 2003, 2006).

The new developed (FCC) Model- Figure (1)- has depended on the approach used in literature review from which it will abstract five tables, each table contains

the factors affecting e-government implementation of one category of (FCC) Model collected from reviewed literature to be a ready stand-alone tool and easy use by specialized researches.

Figure. 1. Five Categories Classification (FCC) Model of factors affecting e-government implementation



Source: own reserach (2020)

The primary goal behind developing FCC Model was to help in building the first step for successor field researches which concern in testing the factors affecting e-government implementation in different countries especially, in developing countries, for that reason, this paper collected the major factors that discussed in literature review, refined them in categories following FCC Model, every category represents an independent base for potential specialized study that testing the effect of a group of factors in a country.

Table. 1 shows mentioned factors, whereas the detailed subfactors that assists in building the measurement scales should be gatherd independently in five table attached to FCC disciplines.

Table 1. main factors affecting e-government implementation refined due to FCC Model

Category	Factors	
Political	believing leaderships in e-government	Clear strategy
	strong leadership	change Resistance
	Top-leadership support	Availability of comprehensive policy, legal, and regulatory framework
	Top-leadership involvement	Legal complexity
	leadership Variations in support	vulnerability to politicians' Interest and influence.

Social	Perceived Awareness	Perceived Privacy
	Willingness/ Attitude to use e-government	Satisfaction.
	Perceived Quality of e-service	Compatibility of systems
	Attitude	Knowledge/ literacy
	Perceived Trust	Perceived-ability to use ICT
	Perceived Risk	Perceived-Image of using e-government.
	Perceived Security	Digital Divide
Technical	Integrated System Availability	Unrealistic Expectations
	Adequate IT/ICT Infrastructure	Availability of Trusted Secured medium.
	System Design	Quality of Technology
	Technical-Support	
Organizational	Resistance to Change	Availability of Architecture Framework
	Administrative-Support	IT literacy/ skills
	Organizational-Benefits and Relevancy	Skilled-Human Resources
	Planning, Goals, Strategy	Organizational-Culture
	Ambiguous Policies	Management-Support
	Competing Objectives	Traditional Organizational Structure
	Balancing various Interests	Collaborative Partnership with Public-sector
Financial	Financial resources Availability	High-Risk Failure
	High-Infrastructure Cost	e-projects Size
	High Implementation Cost	Budgetary Barriers
	Long-term Financial Support	Private-sector Collaboration

Source: compiled by the author based on literature review and FCC Model

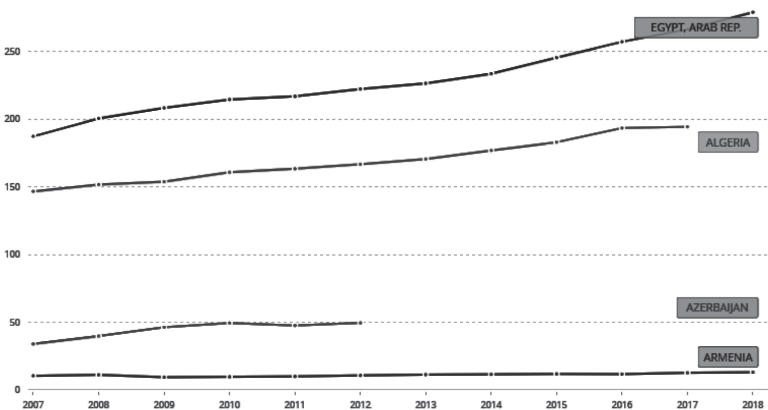
Developing countries digital transformation opportunities

Those countries who are still behind the others in technological progress need policies and investments in their social, economic and technological infrastructure to facilitate growth, so technological innovations offer real opportunities to jump over access barriers, UN (2016). However, technological development in conditions of social, economic and ecological disparities may lead to a “digital divide”. Although ICT infrastructure accessibility and advanced ICT literacy rates among populations, do indeed correlate positively with the economic development of a country and its readiness to embrace e-governance, high GNI as a representative of the measure of economic development, is not a necessary condition for developing e-government and adopting innovative ways of public service delivery.

According to the UN E-Government Survey (2014), many lower income countries have clearly improved their e-governance and the online delivery of services over the last few years. For instance, taking the e-participation index as an example, in 2014 the two leading countries in the world were the Netherlands and Uruguay, whose GNI levels were quite far apart.

By taking a look at the EGDI from UN surveys it can be seen that e-government has been growing rapidly since 2001 (UN E-Government Survey, 2018), from this survey we can confirm the idea that transition toward e-government is not only exclusive to countries with high GNI, since 9 of the 17 countries which advanced from the “middle” to the “high” EGDI class are developing countries. Moreover, there are countries which belong to higher EDGI levels despite having a lower GNI than some countries belonging to lower EDGI levels; for example, Armenia and Azerbaijan belonged to the “high” EGDI level category in the year 2018, while Algeria and Egypt were at the “middle” level in the same year (UN E-Government Survey, 2018), even though Armenia and Azerbaijan had a much lower GNI than Algeria and Egypt, according to the World Bank statistics shown in Figure 2.

Figure. 2. Egypt, Algeria, Azerbaijan and Armenia, GNI comparison, 2007- 2018.



Source: World Bank Data website

In the same context, in 2018 the “low” EGDI category, which includes countries with EGDI of 0.25 or lower, had shrunk by 50% since 2016, all those countries are from least developed countries group with a high risk of deepening the digital divide.

The real opportunities of developing countries to build e-government

As this study found that achieving high levels of e-government development is not attached exclusively to developed countries, and this give the way for developing countries to take the opportunity to jump over access and catch up with developed countries, but this thing is not easy as it seems as the adequate infrastructure is a precondition for e-governments, Rokhman (2011), and this infrastructure is far lower

in developing countries and many of them have insufficient levels of critical potentials (ITU, 2015).

Those arguments may superficially destroy the whole result of this study, but looking more thoughtfully, at long term, ITU (2008) found that digitizing the society does not automatically boost productivity of the government, but its results of optimized performance will show up at long term and effect on national, local and personal levels, also Paroski et al. (2013) found that in spite of financial problems, countries can develop its e-government by creative management, precise plans, spreading technical knowledge and following up and careful executing of the plans, besides, this study approved its notion by real examples of lower GNI countries who achieved higher levels of EGDI from those who have higher GNI levels.

A comparison of FCC benefits

The FCC model presented by this study overcomes the weaknesses of Weerakkody's and Ashaye (2014) models as it adds financial factors as an individual category since financial issues is one of the most influential factors that determine the success or failure of the fund-sensitive e-government implementation process, besides, FCC model attached the five categories with five corresponding tables contains the affecting factors to be an easy-ready tool for empirical studies especially in the conditions of time and funding limits for such projects in developing countries.

Furthermore, other studies concerned in this subject either they only provided the categories without defining the factors like Al-Shafi (2009) or focused on only one category as Bonham et al.'s (2001) which focused on political discipline.

Conclusions

The comparisons between countries on the basis of EDGI and GNI leads to the conclusion that it is not a necessary condition for a country to belong to developed countries to join high or very high EDGI level groups, this reveals of real opportunities for developing countries to jump over access barriers towards e-transformation.

Also, this study concluded that the developed Five Categories Classification (FCC) Model with its correlated tables of factors affecting e-government implementation present a powerful ready tool enabling specialized researchers to choose one or more category matching their disciplines and offering groups of factors ready to use in researches, empirical studies, planning of future e-projects and predicting obstacles may confront executing these projects. So, FCC is an important tool especially for empirical researches-when they are limited in time and budget- to start the field study by choosing one or more ready set of factors matching their study area.

This paper recommends developing countries to conduct deep specialized researches testing the factors that embed or accelerate the implementation of e-government in the light of FCC model since e-government forms a great opportunity for development and catching up with modern society.

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